PLANS *and* SPECIFICATIONS *for* SCHOOLHOUSES

Issued by the State
School Commissioner
by direction of the
Educational Campaign
Committee of Georgia

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Georgia Educational campaign committee

PLANS AND SPECIFICATIONS FOR SCHOOL HOUSES

ISSUED BY THE STATE SCHOOL COMMISSIONER
BY DIRECTION OF THE EDUCATIONAL
CAMPAIGN COMMITTEE OF
GEORGIA

EDUCATIONAL CAMPAIGN COMMITTEE.

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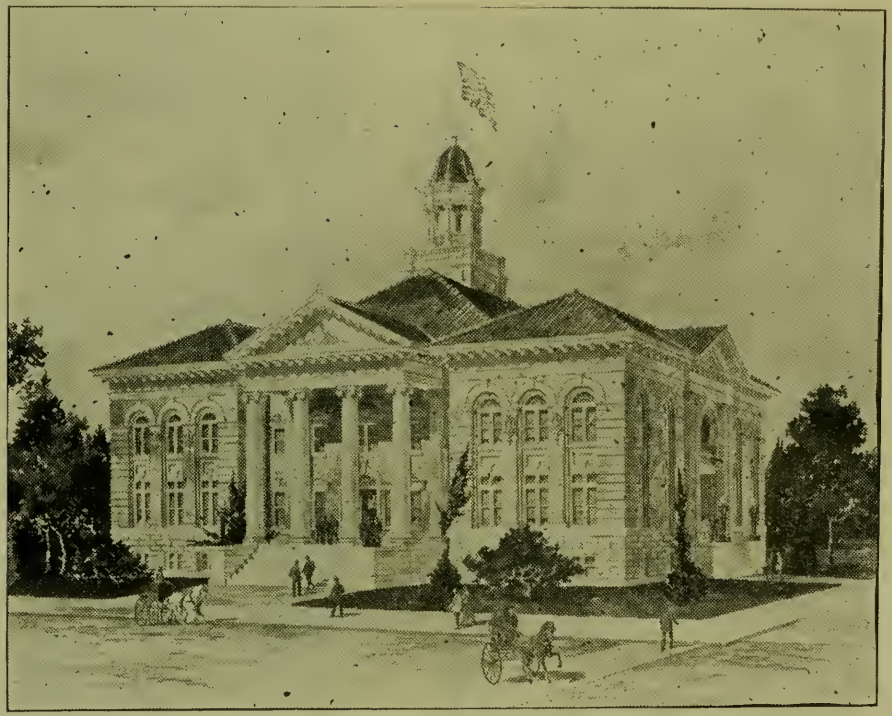
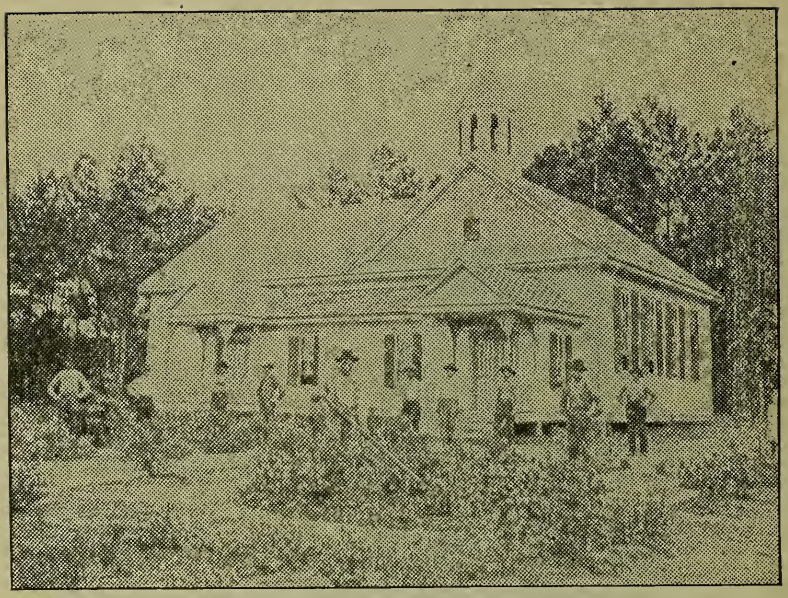
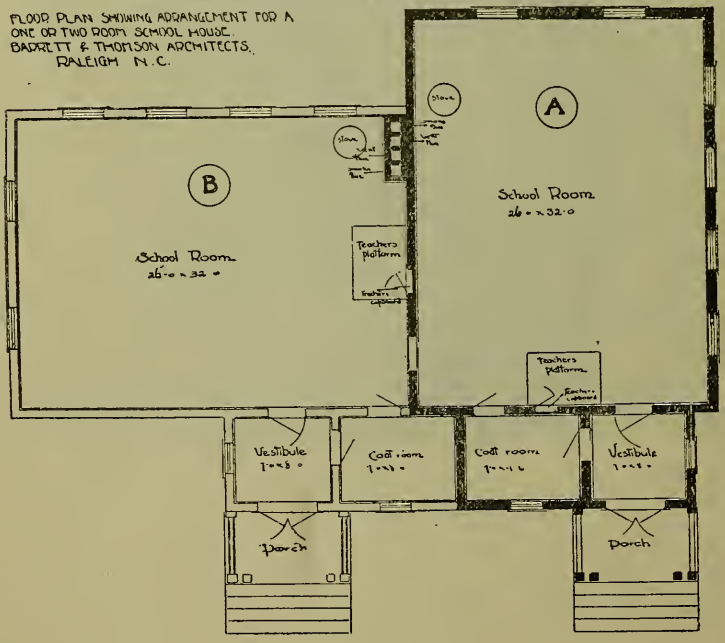


HIGH SCHOOL BUILDING, ALBANY, GA.
Bruce, Everett & Hays, Architects.



FRIENDSHIP ACADEMY, RURAL SCHOOL,
Gwinnett County, Ga.
(This house was built according to floor plan of cut below).



PLAN NO. 1.

There is a growing interest throughout the State in the matter of school buildings. This is manifested, not only through the large numbers of school-houses being built, but also in the many inquiries received at the State Department of Education for plans in building new houses. The supreme need in many communities is that of a comfortable and attractive house in which the children may be taught, and people are commencing to realize this need.

Feeling this demand and the need and advantage of neat, attractive school-houses, the State School Commissioner laid these needs before the Educational Campaign Committee of Georgia, and by their direction this pamphlet has been prepared and is now presented to the school-workers of Georgia.

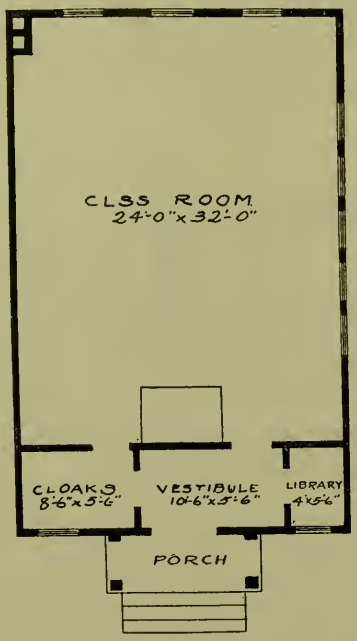
Most of the drawings and plans were prepared by Mr. A. F. N. Everett, of the firm of Bruce, & Everett, Atlanta, Ga. If more particular details are required they may be had at small cost by writing to Mr. Everett.

A supply of these pamphlets will be sent to each county school commissioner, and copies may be had by application to them, or by sending to the State Department.

Comfortable school-houses will conduce greatly to good work on the part of teachers and pupils. It is a notable fact that in the oratorical contests most of the prizes are borne off by students who have attended school in attractive houses. The records also show that the per cent. of attendance is higher in communities where the school-houses are well built and well kept.

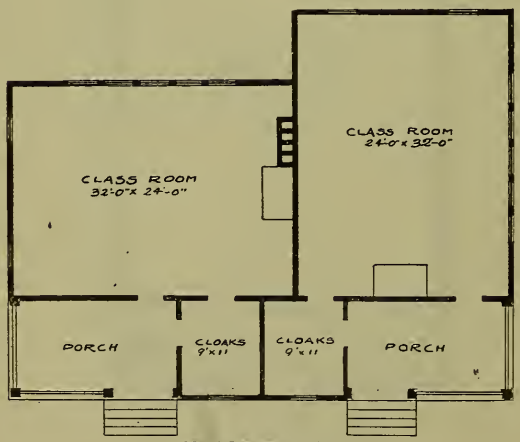
Trustees and other school officials should be interested not only in erecting attractive buildings, but in the character of work done; the work should conform to and be in keeping with the good building.

SKETCH PERSPECTIVE
MODEL ONE ROOM SCHOOL HOUSE
DESIGN NO 1



FLOOR PLAN
MODEL ONE ROOM RURAL SCHOOL HOUSE
DESIGN NO1

FRONT ELEVATION
DESIGN NO. 2
WITH DIFFERENT FRONT



FLOOR PLAN
MODEL TWO ROOM SCHOOL HOUSE
DESIGN NO. 2.

BILL OF MATERIAL FOR ROOM A PLAN NO. 1, WITHOUT TOWER SMALL ROOF VENTILATOR OR PORCH.

(FROM NORTH CAROLINA PAMPHLET OF SCHOOL PLANS.)

The quantities called for in the following bills of material are (unless otherwise mentioned) based on the construction shown by the working plans and details, and any variation from this construction will change the quantities required.

For 9-inch foundation walls, vent and smoke flues for rooms A and B—

10,400 brick.
10 barrels lime.
10 yards sand.

If 13-inch piers are used in place of 9-inch walls for foundation and only vent and smoke flues for Room A built, deduct from the above—

5,200 brick.
5 barrels lime.
5 yards sand:

For plastering side walls and ceilings in class-room and vestibule—

4,000 lath.
8 barrels lime.
4 yards sand.
5 bushels hair.
1 wire guard (for fresh air duct), 12 inches by 14 inches.
1 Japanned iron register (for vent flue), 12 inches by 12 inches.
1 sheet iron stove thimble.
204 lineal feet, 6 inches by 12 inches for sills and girders.
52 pieces, 2 inches by 12 inches by 14 feet, first floor joists.
8 pieces, 2 inches by 12 inches by 17 feet, first floor joists.
170 lineal feet 1½ inches by 3 inches, joist bearer on sills and girders.
290 lineal feet, 1 inch by 4 inches, bridging.
120 pieces, 2 inches by 6 inches by 13 feet, outside studding.
44 pieces, 2 inches by 6 inches by 10 feet, outside studding.
22 pieces, 2 inches by 4 inches by 12 feet, gable studding.
420 lineal feet, 2 inches by 6 inches, for wall plates.
28 pieces, 2 inches by 6 inches by 27 feet, ceiling joists.
8 pieces, 2 inches by 6 inches by 17 feet, ceiling joists.
36 pieces, 2 inches by 6 inches by 20 feet, rafters.
12 pieces, 2 inches by 6 inches by 12 feet, rafters.
26 pieces, 1½ inches by 8 inches by 14 feet, king posts and struts for main roof.

52 pieces, 1½ inches by 6 inches by 10 feet, king posts and struts for main roof.
3,000 feet, ⅞ inch, surfaced sheathing.
1,200 feet, 1 inch by 4 inch, surface shingling strips.
400 lineal feet, ⅞ inch by 2 inch, grounds.
8 pieces, 1¼ inch by 4½ inches by 14 feet, corner casings.
4 pieces, 1¼ inch by 4½ inches by 11 feet, corner casings.
80 lineal feet, 1⅛ inch, quarter round.
2 angle beads, 1¼ inch by 1¼ inch by 11 feet.
2,375 feet, 5½ inch, resawed weatherboarding.
4 rolls, 2,000 square feet, water-proof building paper.
140 lineal feet water table.
28 pieces, ⅞ inch by 12 inches by 14 feet, for gables.
400 lineal feet, ⅞ inch by 2 inch, O. G. battens for gables.
190 lineal feet, each member main cornice.
70 lineal feet, each member, coat-room and vestibule cornice.
12 pieces, 1¼ inch by 4½ inches by 10 feet, for outside steps.
4 pieces, ⅞ inch by 7½ inches by 10 feet, for outside steps.
1 piece, 2 inches by 14 inches by 12 feet, for outside steps.
15,000 shingles.
1,200 feet, ⅞ inch by 2½ inch, flooring.
6 class-room window (with transoms) frames, sash, glass and trim.
1 coat-room window frame, sash, glass and trim.
1 vestibule window frame, sash, glass and trim.
2 gable slat ventilators.
1 outside double entrance door frame (with transom), door and one side trim.
1 class-room door frame (with transom), door and two sides trim.
2 coat-room door frames, doors and 2 sides trim.
1 teacher's cupboard, door frame, door and one side trim. (See floor plans for size of doors and windows.)
560 feet, ¾ inch by 3 inch, ceiling for coat-room.
150 lineal feet, ¾ inch, quarter round.
128 lineal feet wainscoting, cut 2 feet 10 inches long.
128 lineal feet, 8 inches base.
128 lineal feet, base moulding.
128 lineal feet, moulded cap. (See details for style.)
40 feet flooring.
16 lineal feet, ⅞ inch by 7 inches, rise and scotia for teacher's platform.
40 lineal feet chalk trough and cap for blackboard.
1 cylinder mortise knob lock, three keys, top and bottom bolt.
3 pair butts for outside doors.
3 mortise knob locks, 4½ pair butts, for inside doors.
1 small mortise knob lock.
1 pair butts for teacher's cupboard.
7 pairs butts for transoms.

1⅓ dozen sash lifts.
8-12 dozen sash locks, 7-12 dozen transom workers.
8 dozen wardrobe hooks.
Sash, weights and cord for eight windows.

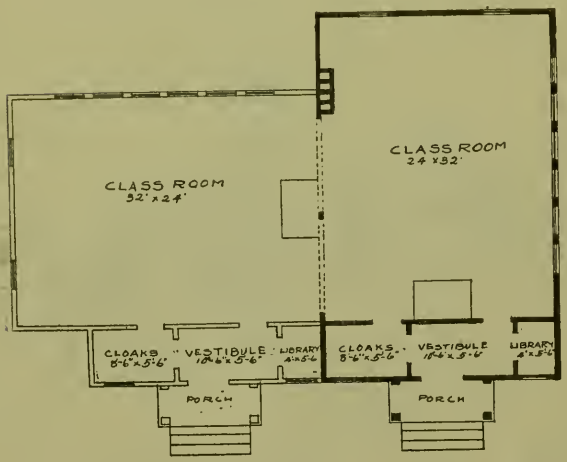
BILL OF MATERIAL FOR ROOM B, PLAN No. 1.

NOTE.—In this bill no allowance is made for old material saved in making the additions. Deduct amount saved.

For 9-inch foundation wall—
5,800 brick.
6 barrels lime.
6 yards sand.
If piers are used deduct—
4,000 brick.
1 barrels lime.
4 yards sand.
For plastering side walls and ceilings in class-room and vestibule—
4,000 lath.
8 barrels lime.
4 yards sand.
5 bushels hair.
1 wire guard (for fresh air inlet), 12 inches by 14 inches.
1 Japanned iron register (for vent flue), 12 inches by 12 inches.
1 sheet iron thimble.
130 lineal feet, 6 inches by 12 inches, for sills and girders.
52 pieces, 2 inches by 12 inches by 14 feet, first floor joists.
8 pieces, 2 inches by 12 inches by 17 feet, first floor joists.
170 lineal feet, 1½ inch by 3 inch, joist bearer.
290 lineal feet, 1 inch by 4 inch, bridging.
94 pieces, 2 inches by 6 inches by 13 feet, outside studding.
36 pieces, 2 inches by 6 inches by 10 feet, outside studding.
12 pieces, 2 inches by 4 inches by 12 feet, gable studding.
260 lineal feet, 2 inches by 6 inches, for wall plates.
28 pieces, 2 inches by 6 inches by 27 feet, ceiling joists.
8 pieces, 2 inches by 6 inches by 17 feet, ceiling joists.
48 pieces, 2 inches by 6 inches by 20 feet, rafters.
12 pieces, 2 inches by 6 inches by 12 feet. rafters.
26 pieces, 1½ inch by 8 inches by 14 feet, king posts and struts for main roof.
52 pieces, 1½ inch by 6 inches by 10 feet, king posts and struts for main roof.
2,450 feet surfaced sheathing.
1,500 feet, 1 inch by 4 inch, surfaced shingling strips.
400 lineal feet, ⅞ inch by 2 inch, grounds.
4 pieces, 1¼ inch by 4½ inches by 14 feet, corner casings.
2 pieces, 1¼ inch by 4½ inches by 11 feet, corner casings.
70 lineal feet quarter round.

1 angle bead, 1¼ inch by 1¼ inch by 11 feet.
1,800 feet, 5½ inch, resawed weatherboarding.
3 rolls, 1,500 square feet, water-proof building paper.
110 lineal feet water table.
14 pieces, ⅞ inch by 12 inches by 14 feet, for gables.
200 lineal feet, ¾ inch by 2 inches, O. G. battens, for gables.
120 lineal feet, each member, main cornice.
60 lineal feet, each member, coat-room and vestibule cornice.
12 pieces, 1¼ inch by 4½ inches by 10 feet, for outside steps.
4 pieces, ⅞ inch by 7½ inches by 10 feet, for outside steps.
1 piece, 2 inches by 14 inches by 12 feet, for outside steps.
13,500 shingles, 72 lineal feet, 14 inches, valley tin.
1,200 feet, ⅞ inch by 2½ inch, flooring.
6 class-room window (with transoms) frames, sash, glass and trim.
1 coat-room window, frame, sash, glass and trim.
1 vestibule window, frame, sash, glass and trim.
1 gable slat ventilator.
Weights and cord for eight windows.
1 outside double entrance door frame (with transom), doors and one side trim.
2 class-room door frames (with transom), door and 2 sides trim.
2 coat-room door frames, doors and 2 sides trim.
1 teacher's cupboard, door frame and 1 side trim.
(See floor plans for size of doors and windows.)
560 feet, ¾ inch by 3 inch, ceiling for coat-room.
150 lineal feet, ¾ inch, quarter round.
128 lineal feet, wainscoting, cut 2 feet 10 inches long.
128 lineal feet, 8-inch base.
128 lineal feet base moulding.
128 lineal feet moulded cap.
(See details for styles.)
40 feet flooring.
16 lineal feet, ⅞ inch by 7 inch, riser and scotia for teacher's platform.
40 lineal feet chalk trough and cap for blackboard.
1 cylinder mortise knob lock, three keys, top and bottom bolt.
3 pairs butts for outside doors.
4 mortise knob locks.
6 pairs butts for inside doors.
7 pairs butts for transoms.
1 small mortise knob lock, 1 pair butts for teacher's cupboard.
1⅓ dozen sash lifts.
8½ dozen sash locks, 7 transom workers.
8 dozen wardrobe hooks.

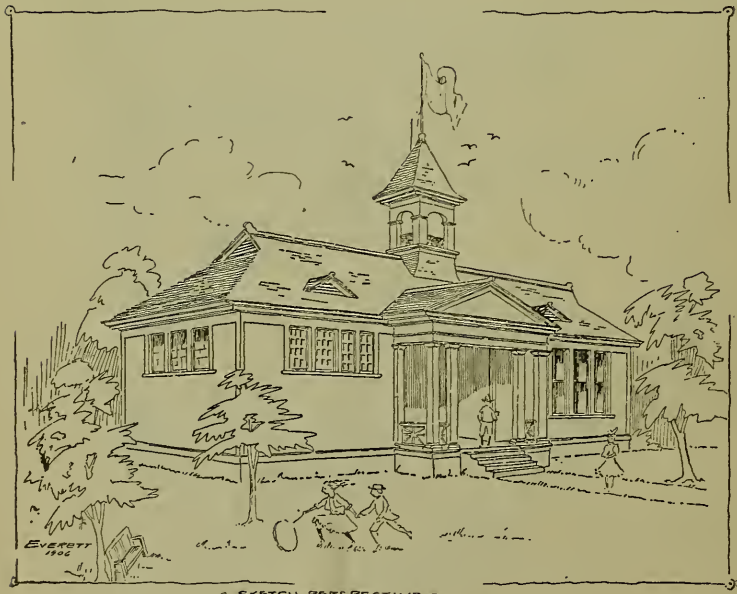
FRONT ELEVATION
PROPOSED ADDITION TO ONE ROOM SCHOOL HOUSE
DESIGN NO. 1



PLAN
PROPOSED ADDITION TO ONE ROOM SCHOOL HOUSE
DESIGN NO. 1

•PERSPECTIVE SKETCH•

MODEL TWO ROOM SCHOOL HOUSE
DESIGN No 1.



• SKETCH PERSPECTIVE •
• MODEL THREE ROOM SCHOOL HOUSE •
DESIGN No 1.

GENERAL SPECIFICATIONS FOR ONE-STORY FRAME SCHOOL BUILDINGS THAT APPEAR IN THIS PAMPHLET.

It is the aim of the writer to direct attention to those practical details which concern comfort, convenience, structural strength, leaving entirely out of the question all discussion of such matters as style, etc. Tastes vary and each must and will follow his own inclination. Any of the designs found in this pamphlet will be in good taste and are economical in cost.

THE SITE.

If the site is level and well drained, little needs to be done in the way of grading except to dig trenches for the foundation. If, however, the building is to be on a hillside, whatever grading is necessary to secure a level site and the necessary terraces should be done before erecting the structure and at the same time the trenches should be excavated. At such time the work can be prosecuted at much less expense than after the building has been erected; and, after, it will stand as an obstruction to the removal of the earth by the easier method of carts and earth-scoops.

It will be found economical in the end to consult a surveyor as to levels. If the location is upon a hill, it will be well to locate the house the long way, parallel with the face of the hill. In other words, the style of the house should be wide rather than deep. This will save considerable in foundation work.

DRAINAGE.

In the case of building on the side of hills, careful attention should be given to drainage and the waterways should be studied before planning the gutters or soil pipes. Either of two (2) systems—surface gutters or sub-soil pipes—should be sufficient in capacity to carry off the water of a heavy rainfall.

Care should be taken to insure a safe flow of the water from the house on all sides and it may be well to have a gutter two or three feet wide around the walls of the house.

EXCAVATION.

If the building is to be on natural ground, excavation for walls and piers should not be less than twelve inches below the surface of the ground. If it is soft ground or filled earth, the footing courses should go considerably deeper until you reach solid earth, if possible. If not, charred boards may be used in the bottom of trenches to extend about two feet on each side of foundations.

BRICK WORK.

All exposed brickwork should be built of all hard burned brick laid up in lime mortar. Brick in chimneys from first floor joist to topping out of rafters can be of all soft brick. Flues for stoves to be eight inches by eight inches smoothly plastered on inside. Ventilator flues to be built where necessary and as hereinafter specified under the head of "Ventilation."

All woodwork must be kept away from chimneys at least two inches by framing trimmers and headers.

Sand should be clean and sharp and not too fine. The lime should be free from air slack and used in the proportion of one of lime to three of sand.

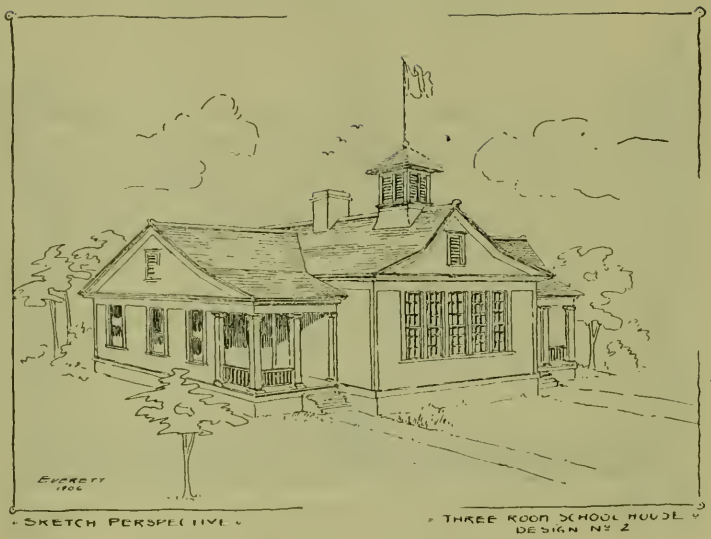
No piers to be placed more than eight feet apart and should be twelve inches by twenty-four inches in size. Footings to be formed by setting in three courses of two inches each.

If curtain wall is used to enclose verandas or front of house, this may be built four inches thick and should be carried up at the same time of piers adjoining same.

CARPENTRY.

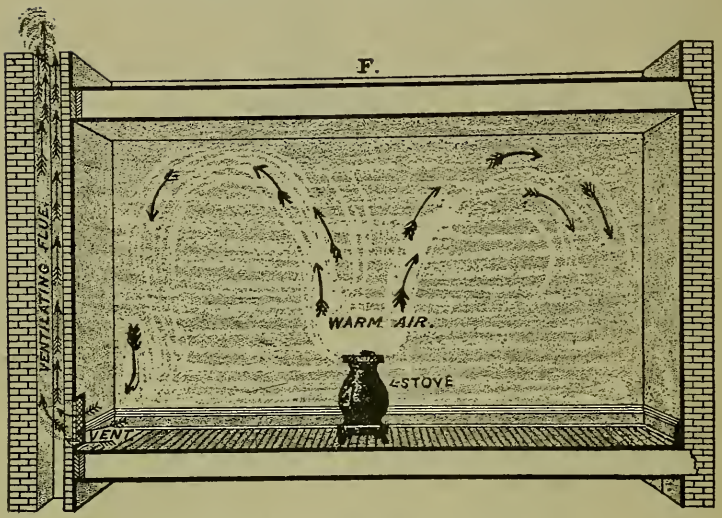
All framing to be well braced and held together by steel wire spikes and nails. Put up perfectly true and plumb.

House to be balloon frame. Size of timbers as follows:

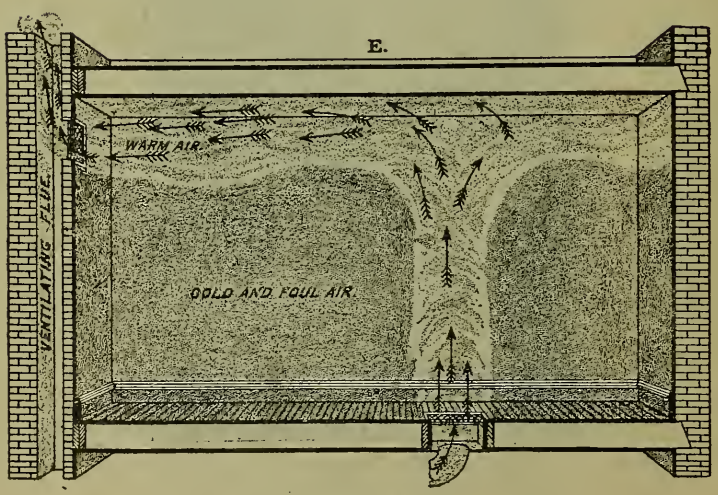


"A BOY AT HIS DESK IN AN OLD-FASHIONED COUNTRY SCHOOL.

From Kern's *Among Country Schools.*



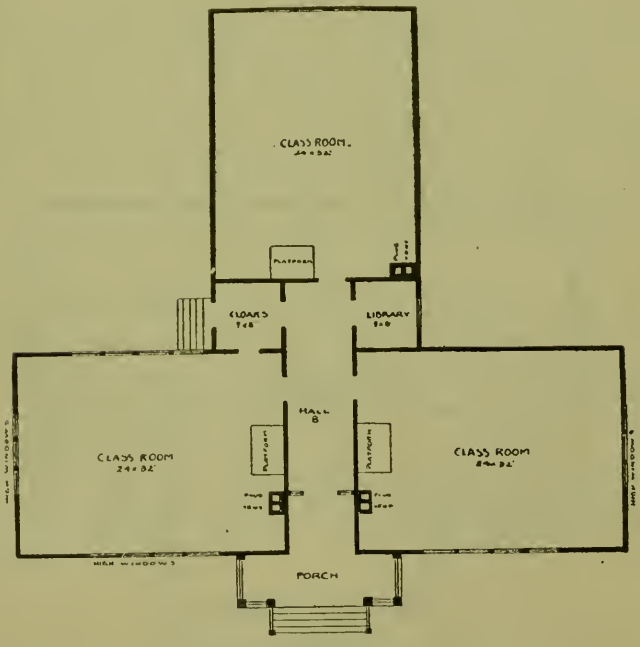
An iron jacket to be placed around stove.



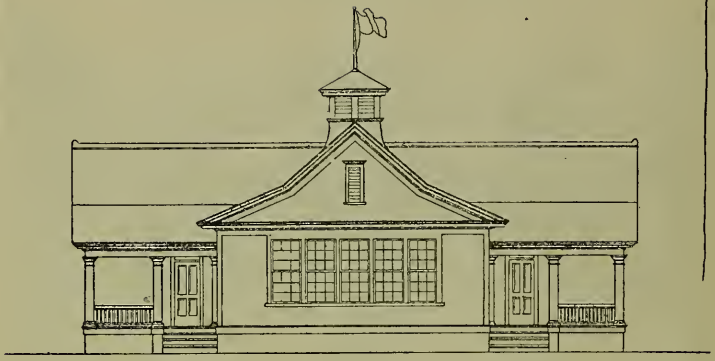
Defective System.

(From Circular of Information, No. 3, 1891, United States Bureau of Education.)

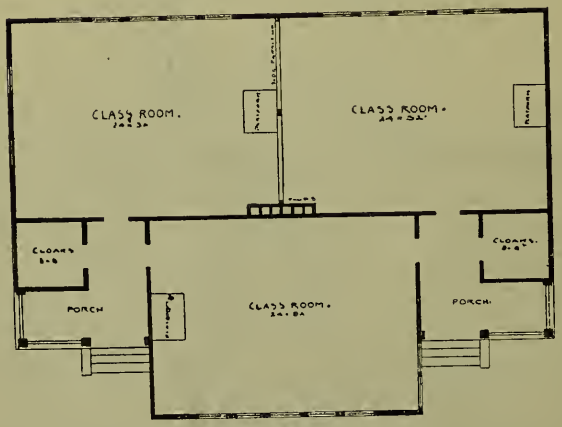
- FRONT ELEVATION -
- DESIGN NO 1 -



- FLOOR PLAN -
- MODEL THREE ROOM RURAL SCHOOL HOUSE -
- DESIGN NO 1 -



: FRONT - ELEVATION :
DESIGN NO 2.



: FLOOR - PLAN :
: MODEL THREE ROOM RURAL SCHOOL HOUSE :
· DESIGN NO. 2.

Sills to be six inches by ten inches.

Floor joists to be two inches by ten inches, placed sixteen inches on centers.

Ceiling joists to be two inches by six inches, placed sixteen inches on centers.

Studs to be two inches by four inches, placed sixteen inches on centers.

Main rafters to be two inches by six inches, common rafters and jacks to be two inches by four inches. Rafters to be twenty-four inches on centers.

Corner and angle posts to be four inches by four inches with two inches by four inches spiked on to form angle.

If the house is to be sheathed, use for same, square-edged sheathing boards, laid on diagonally and securely nailed into each and every bearing with one nail in each edge of board.

Weatherboarding to be A-1 in quality, put on in uniform widths, showing four and one-half inches to the weather.

Shingles for roof and verandas must be all heart, A-1 Georgia pine, as this is a very important part of the building. Shingles nailed on roof strips, strips to be one inch by three inches. Shingles to be exposed on roof five and one-half inches to the weather. All hips to be mitered and eaves to be protected by galvanized iron ridging.

All flooring exposed outside, on porches and vestibules, to be in one length, A-1, laid in white lead, joints well drawn together, secret nailed. Interior floors to be A grade, two and one-half inches face, seven-eighths of an inch thick. Secret nailed and well drawn together.

Window frames to be made boxed for pulleys, weights and cords; all properly balanced to sash. Outside door frames to be all heart.

CEILING.

The ceilings to rooms should be ceiled with beaded ceiling, tongued and grooved, well drawn together.

Wainscot all rooms with narrow beaded ceiling to height

of chalk rail. Chalk rail to form a cap for same. Put neat quarter round at floor.

BLACKBOARDS.

Blackboards should extend entirely around schoolroom. Have the top about six and one-half feet from floor. For use of young children, the boards should reach to within two feet of floor. The height of boards to be determined by the age and size of children that occupy the different rooms. Slate boards are noisy and expensive. Wooden boards are also noisy and unsatisfactory. Paper or artificial slate boards are the most satisfactory. There are several manufactures of this kind of blackboard and it would be well for the School Committee to get samples from each, before selecting.

HOW TO MAKE PAPER BLACKBOARDS.

When a new building is to be erected, let the walls be plastered in the usual manner, except that the final coat, instead of being composed only of lime-putty and plaster of Paris, should contain also sufficient good sharp sand to make a very hard surface, and it must be troweled till perfectly smooth.

When the plaster is fully dry, it is ready for the paper. Select manilla paper of medium thickness, not thick, having a good, smooth, calendered surface. Spread the paper cut to the appropriate size on a clean floor, and wet it with cold water, using a clean whitewash brush; apply good cooked flour paste (cold); lay the paper on the wall and smooth it down with a brush, as in ordinary paper hanging. A soft cloth can be used instead of a brush. Nail a neat moulding around the edge.

When dry, apply any good slating, and the next day rub the slating with fine sand-paper. Apply two or three coats in the same manner, rubbing each coat as the first. If the slating is of good quality, the boards, though constantly used, will not need to be reslated within two or three years. It is probably economy to apply three or four coatings of slating at first, as it will prove far more durable. Old cement boards

or slated walls, if they are reasonably solid, may be cheaply converted into good boards by first filling smoothly any cracks and holes by a mixture of lime-putty and plaster of paris, and then applying paper, as described above. Paper will not adhere to thick coats of whitewash. If old walls are loose and shaky, they should be replaced by new ones and then papered, as in new walls.

Boards should not be washed, but can be well cleaned with a piece of dry flannel.

If the erasers are made of a material which will hold the dust, and they are dusted every day by striking them against a board out of doors, there will not be very much annoyance from crayon dust.

DESKS.

The best schools have adopted single desks and no more double desks should be used, as they cause the spread of disease and contaminate the pure by close relationship with immoral seat mates. The amount of study is lessened and the need of discipline is increased by children sitting together.

Great care should be exercised to adapt the height of desks to the size of children who occupy them.

The best furniture will in the end be the cheapest.

Cloak rooms should have wainscoting to height of three feet. To have coat and hat hooks sufficient number to accommodate pupils.

Teachers' closets should be supplied with shelves and hooks.

VENTILATION.

In building an ordinary single room district schoolhouse a brick flue should stand at least two or three feet in the clear. This flue should contain in it an eight-inch heavy iron pipe placed in the center and extending fully two feet above the top of the brick flue. Directly under the floor should be connected by means of the pipe, two or more registers placed in opposite parts of the room directly in the floor, being careful not to place them under the stoves. These registers should be at

least sixteen inches by twenty inches and after the fire is built, should always be opened. When the fire has burned sufficiently long, there will be an upward current of air in the brick flue which will exhaust the vitiated air of the schoolroom. To provide fresh air if an ordinary stove is used an opening can be made directly in the center of the stove twelve inches by sixteen inches with a pipe fitted to this connected with the outside. This pipe, or wooden box if preferred, should contain a damper which may be closed at night and by means of which the supply of fresh air may be regulated, depending on the wind and temperature. The pipe in the stove should extend to within four inches of the bottom of the stove and should be fitted with a flange running over and under the top of the stove and projecting two inches beyond on both sides with a pipe two inches by three inches so as to give an upward direction to the air as it becomes heated by the bottom and sides of the stove.

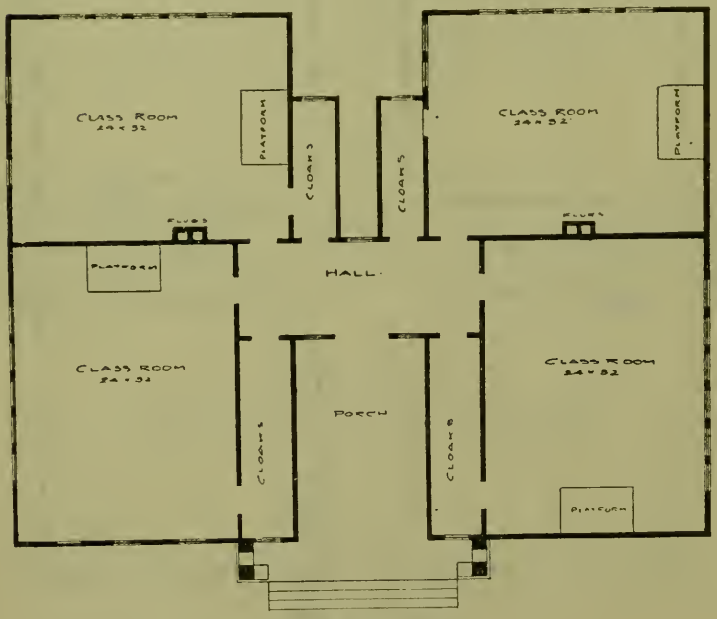
LIGHTING.

Special attention should be given to the size and location of windows, quality, and mounting of glass should be in a manner that will not interfere with the transmission of light by casting shadows. All windows should be high and all windows covered by shades for controlling the light so that the supply of light may come from above and not from below. The light should not be sparingly admitted and it should not be too strong to be trying on the eyes. The light supply should be located so as not to come from opposite directions and desks should be arranged so that the light will come from above and from the left side. Clear glass free from flaws and irregularities is best calculated to transmit light. Tinted or colored glass should not be used in the schoolroom. High windows in the rear of schoolroom to admit of ventilation, also casting high light that is so necessary.

PAINTING.

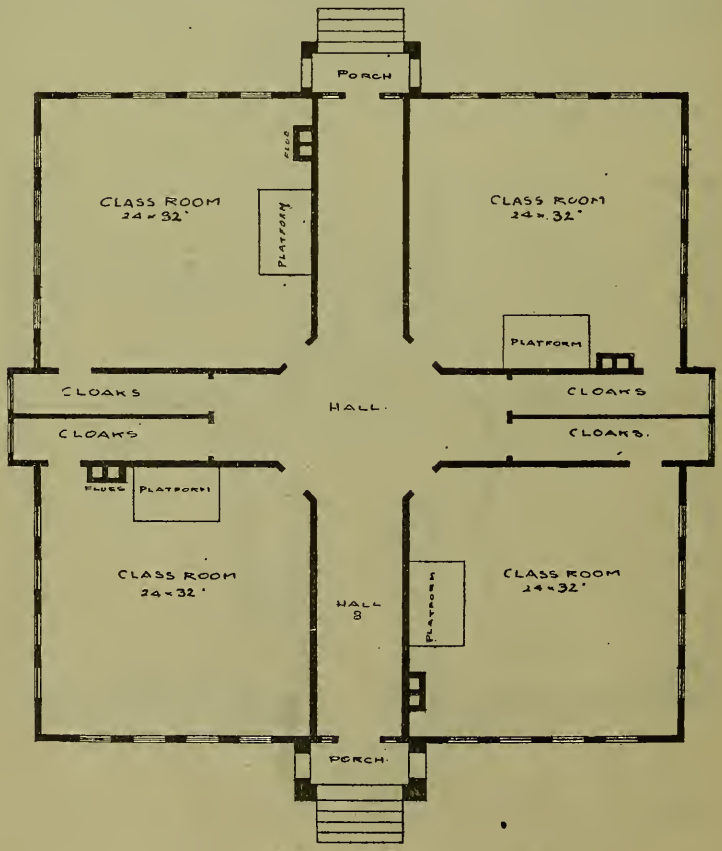
Exterior painting should be done in colors best suited to

• SKETCH PERSPECTIVE •
• MODEL FOUR ROOM SCHOOL BLDG. •
DESIGN Nº 1 •



• FLOOR PLAN •
MODEL FOUR ROOM SCHOOL HOUSE
DESIGN Nº 1.

SKETCH PERSPECTIVE
MODEL FOUR ROOM SCHOOL HOUSE
DESIGN NO. 2.



FLOOR PLAN
MODEL FOUR ROOM SCHOOL HOUSE.
DESIGN NO. 2.

the eyes, neutral tints being preferred. Lead and oil should be used in the outside painting, three coats. Walls and ceilings of school-rooms should be tinted in colors, preventing any glaring effect and under all circumstances the effect of light upon the eyes should be soft and free from glare and of sufficient strength to see with clearness and study with comfort. Interior woodwork can either be painted soft grays or can be stained natural wood finish. The latter method is more durable and more cleanly. All tinwork on roofs and decks to be painted one coat on under side before applying and two coats on upper side after being laid, of mineral paint. Roof shingles can be either painted or dipped in creosote stain. This adds to the appearance of the building and protects the shingles from the weather. A good creosote stain should be used and shingles dipped two-thirds of their length before being put on. A more economical way, however, is to brush coat the stain after the shingles are on. This does not permit of the stain getting down in the cracks.

PLUMBING.

Where there are no waterworks, outside closets should be used and the same should be placed a good distance from the main building. The buildings to be sufficiently large to accommodate the pupils and to be protected by lattice screens from the outside.

WATER SUPPLY.

It is very essential that the water supply for drinking purposes should be of the very best. Wells should be located so that the surface water will not run into same. The greatest care should be taken in the selection of drinking water. If stoves are used in rooms there should be always a vessel of fresh water kept on same to keep the air moist. It is a good idea to have several buckets of water kept in convenient places as a protection in the case of fire.

A. F. N. Everett,
Architect.

SUGGESTIONS ON THE SCHOOL BUILDING.

The plan and model of a house should conform to the use to be made of it. It is not economy to build a schoolhouse after a pattern better suited for some other purpose. The comfort and health of the children for every school day in the year should be kept constantly in mind; instead of the accommodation of the community at the annual concert or similar occasion.

Strength and comfort are first considerations. Convenience and beauty are to be thoroughly considered.

The foundation should be of brick or stone, and the floor high enough from the ground to admit of free circulation of air, and to prevent the decay of timbers on account of moisture absorbed from the ground.

The floor should be doubled, and airtight. After it is thoroughly dry, it should receive two coats of linseed oil. This will preserve the wood and prevent the accumulation of unhealthy germs.

Many a case of lung trouble, pneumonia, grippe, etc., has been caused by a crack in the schoolroom floor. The brain can not do its best work if the feet are cold.

After an inspection of hundreds of rural school buildings, I am convinced that more defects are to be found in the arrangements for lighting and ventilating than in any other respect. The average school patron does not realize the importance of these points, and too often the teacher is negligent concerning them.

When pupils are sluggish, inattentive, or irritable, there is cause to believe that the air is not so pure or the light not so good, as should be.

The admission of fresh air into the room without causing a draft is often a problem hard to solve. If the matter is given the proper attention during the construction of the building it will save much worry and trouble.

The two floor joists (sleepers) that pass under the place

where the stove is to be set should be carefully ceiled on the under side; a hole cut in the weatherboarding above the sill at the end of this flue as long as the joists are apart and as wide as the joists. This hole should be covered with wire gauze. A hole should be cut in the floor just under the stove about eight inches square. This should also be covered with wire gauze. This air box, if constructed as suggested above, will be eight or ten inches deep and one and a half or two feet wide. It should be perfectly airtight under the house so that dust or foul air from under the house would not be drawn into it.

If no air leaves the room none can enter; therefore it is necessary to provide a vent for the escape of the impure air. Hot air rises and if this opening is made in the overhead ceiling, the cold air in parts of the room not near the stove will remain unchanged and not heated. The carbonic acid gas which is given off by the pupils in breathing is heavier than air and if the escape vent is not near the floor this foul gas will not be removed, although pure air may be passing through the room.

At the gable end of the room, sheet two studs with tin, or tar paper. The plate should be cut out between these two studs and the box continued to within two feet of the comb. Here an opening should be made in the weatherboarding as large as the space enclosed between the studs. The tin or paper on the inside should be pulled across and attached to the weatherboarding just above this hole.

At the floor the baseboard should be cut out between these two studs. The holes at each end of this flue should be protected with wire gauze to keep out birds and rats. If this flue is not made airtight on the sides, the cold air rushing through the cracks of the weatherboarding will prevent its taking the air from the room.

Around the stove should be a sheet iron jacket, a foot higher than the stove, and six to twelve inches from its sides all around. As the air inside this jacket is heated and rises, the

air from the flue underneath rushes up to take its place and be heated. The air in the room is pressed down, and being warmer than the air outside, causes a draft through the opening in the baseboard at the end of the room.

It is no extra cost to have the windows so arranged that the rooms of the building may be properly lighted and ventilated; but only a small per cent. are so arranged.

The windows may be as far as three feet above the floor, but they should reach within a foot of the ceiling. The upper sash should be hung with weights or on hinges. In most schoolrooms the space above the tops of the windows is one-fourth or more of the space in the room. Only when the air in this space is cooler than that on the outside will it descend and pass out the openings.

The windows should be sufficient in number and size to equal in area one-fourth to one-fifth of the floor space. Even more than this per cent. should be provided if the room is more than half as high as it is wide. Eleven feet is high enough for a room twenty-five feet wide.

Under no circumstances should windows be at that end of the room toward which the pupils face when seated. If only one side is lighted, so arrange the seats that the light comes to the left side of the pupil.

If possible the room should be so located that the pupils seated shall face north. All maps should be hung on the north wall. This is especially important in the arrangement of rooms for primary grades.

The advantages in favor of patent desks outweigh the difference in cost between them and seats made at home. The size of the pupil to be seated should be in mind when seats are purchased or made.

It is barbarous and often results in lasting injury to require the child to occupy a seat so high that its feet can not reach the floor.

If patent desks are bought they should be properly put together. Many school-desks in the State would have lasted twice as long if they had been properly put together.

Sometimes it is not desirable to fasten the desks to the floor. The following plan has been found effective in keeping the desks in position and permitting easy removal for sweeping or change of arrangement in the room. Use slats one and a half inches by three, long enough for three desks. Fasten the desks to these with screws. This section is too heavy to be easily pushed out of position, and yet light enough to be moved to any part of the room by two pupils.

Each coat room should be provided with a shelf with hooks on the outer edge for hanging coats. When hung against the wall, damp wraps retain the moisture and are more apt to injuriously affect the child when again used.

The schoolhouse and its surroundings should be attractive to the eye. The refining and cultural influence of a beautiful building and grounds can not be overestimated. The proper respect for property rights, law, order and systematic labor is much harder to teach the child if the house and its surroundings are not attractive.

The architectural design of the building has its effect on the character of each child that attends the school. If patrons comprehended the lasing effects of the convenience and comfort and beauty of the house on the child, our school buildings would all be models of elegance.

The time has come when county boards may demand such conditions of school grounds, buildings, and appurtenances as will insure the comfort and health of the pupils. No school should be permitted to open until the building is put in good condition for heating, lighting and ventilation. The conditions of the grounds and the outbuildings should come up to the standard requirements. It is gratifying to know that in most communities these matters are being properly regulated by the local trustees; but such things are too important to pass without notice even though of rare occurrence.

It is a notable fact that in communities where much complaint of vandalism was formerly made, that since the property has been turned over to the county board and put in first-class condition, cause for these complaints has disappeared.

THE COUNTY SCHOOLHOUSE AND ITS GROUNDS:

AN AID TO AGRICULTURAL TRAINING.

By the Hon. James Wilson, Secretary of Agriculture.

[*Reprinted from The Youth's Companion, March* 14, 1901.]

Sometimes the country schoolhouse has extensive and well-kept grounds, but oftener it is in a pasture, a cultivated field or a wood-lot. In these instances, although the playgrounds are usually adequate, the opportunities for object-lessons in natural history and in various profitable but incidental lines of study may not be recognized.

The young farmer can not be introduced to Nature too soon, and should never be long separated from her object-lessons. Suitable text-books designed to lead him by easy stages are still few and not well arranged.

We live in an age of specialized work, and men of education must usually, if they would become impressive, confine their inquiries to one channel. The farmer deals with soils, plants and animals, with heat and cold—in short, with nature in her varied forms and manifestations. It would seem wise, in the interest of the commonwealth and of himself, that he should be made thoroughly acquainted with soils and their composition, with the life of plants and animals, and with the various species that may be expected to flourish in particular localities and climates.

Yet although the farm keeps the balance of trade in the nation's favor, furnishes two-thirds of our exports, contributes to our manufacuring supremacy by providing cheap food for our mechanics, comparatively little has been done toward educating the farmer for his work. To be sure, the United States has done more for him than any other country. In 1862, Congress endowed agricultural colleges to teach the sciences relating to agriculture. In 1867, experiment stations were provided for, where research might be made into the operations of nature.

THE OLD AT WOLF FORK, RABUN COUNTY, GA. SOLD FOR $17.

THE NEW AT WOLF FORK. VALUE OF BUILDING AND EQUIPMENTS, $600.

SCHOOL GARDEN.
Plain's High School, Sumter County.

"A COUNTRY SCHOOL LIBRARY."
From Kern's *Among Country Schools.*

But considering that Americans pay more money for public education than any other people on earth, a comparatively small proportion of the sum is devoted to stimulating and aiding that half of our population who cultivate the soil. The tendency of primary education has been to lead the country youth away from the farm instead of helping him in the study of those sciences relating to production. It would be politic and patriotic to incorporate into the farm youth's education some knowledge that shall bear more directly upon his future life and work.

And first, the grounds around the schoolhouse could be made to speak out in a language easily intelligible to the youth, whose eyes have been familiar with nature from the days of the cradle.

Flowers should abound in the schoolhouse grounds. They are among the best of educators, for they develop taste and a love for the beautiful, and make men sensitive to the attractive and lovely, in town or country, in field or forest.

Moreover, the flower of the plant has an economic use, concerning which the scholar should be informed. Nature designed it to invite the wayfaring insect, and we can employ it to delight the child in its first journey away from home. Little people, in fair weather, should not sit long at a time on benches in school. The lawn should be arranged for their pleasure, and in any such arrangement flowers can not be omitted. Although their language will not be immediately understood, the child will, by gradual acquaintance, learn to know and love them. The country boy is usually bashful, and has little to say to new acquaintances; the flowers would get into his confidence sooner than most strangers. He would not miss home and mother and familiar things so much.

Instructive lessons about annuals, biennials and perennials could be taught as the years go by. The names of the plants and of their several parts would be memorized much more readily from the living subject than from a book. At recesses and during the noon hour much of the plant-lore given to the

more advanced students would be dealt out by them to the beginners. Young people do not hide things under a bushel. The study of nature's book is never regarded as a task, and what she tells us in her own peculiar way finds almost always an open mind and a retentive memory.

In the very best rural schools are found herbariums, fishes preserved in alcohol, samples of rocks, soils, woods and minerals. There are few districts in any of our States that can not afford these collections, and there is no good reason why the country teacher should not use the out-of-door object-lessons that are so abundant, so inviting, and altogether so appropriate for the best development of the young farmer.

Heat and moisture are good servants of the cultivator when controlled, but severe masters where, through ignorance, they are permitted to have their own way. Their potent influence on production is generally overlooked in the education of the farmer. The subject is certainly neglected entirely in most of our country schools, important thought it may be to the future welfare of the child.

Advanced research to discover the effects of heat and moisture on production is receiving some attention at our agricultural colleges, and valuable results are available to the students who reach the colleges; but these are comparatively few in number. The State college endowed by Congress offers to the farmer a kind of intermediate stage of education, but he is given no practical beginning in the common school, and there is no university in which, after graduating from college, he might carry on specialization.

Many of us have distinct recollections of disagreeable schoolhouses and grounds. We ought to arrange matters so that different impressions will be made on the little people who now venture from home and go to school. We should associate as many attractive things around the schoolhouse as can be brought together, just as we make the parlor the most beautiful room at home in order that our friends may be pleased while they visit us.

THREE SCHOOLHOUSES.

2 (A Log Cabin boxed in since being used as a Schoolouse.)

In Rockville District, Putnam county, Georgia, before the present Rockville Consolidated School was built.

ROCKVILLE CONSOLIDATED SCHOOL, PUTNAM COUNTY, GA., (NINE MONTHS' TERM).

Built in 1889, out in the pine forest, to which not a single road led, and in sight of which not a single dwelling stood. To-day, quite a progressive village with a pretty church, two up-to-date stores, several handsome modern dwellings, and at the Oconee Springs, two or three miles beyond, a large two-story hotel. The school has two teachers, the principal of which has been in charge fifteen consecutive years and the assistant, just recently resigned, nine consecutive years. The past term, and this is no better than the average for years past, every child of school age in the community attended school regularly except four. Two of these had previously completed the course, and two others, large boys, had stopped to work on the farm.

Flowers and plants are most pleasing additions to the house as well as to the lawn. Students should be taught the daily care necessary to have healthy and beautiful flowering plants, the uses of the spray, and the remedies for infesting or destructive insects.

The children of a schoolroom will watch with interest the unfolding of new leaves, the first appearance of a bud, and finally the bursting petals of a beautiful blossom. Without much extra labor the paths that should be artistically laid out on each schoolhouse lawn can be edged with neat, blooming border plants. The pupils would always delight in caring for and protecting them.

Flower-beds on the lawn are pretty if properly made. A few hyacinth bulbs planted in the fall make almost as early reminders of spring as the hepatica or the ambitious crocus that laughs at a snow-bank. The hyacinth bulb is interesting from the moment it peeps through the ground, and its flowers are satisfactory, too, because they last longer than those of most other early bloomers.

The gathering of seeds from all trees, shrubs and plants should be encouraged. If all the seeds be saved, pupils whose parents have not encouraged flower culture may be induced to make little flower-gardens at home, and incidentally to take pride in the appearance of the yard.

Small trees and shrubs look well set out as a hedge, besides furnishing a shade on one side of the lawn. Each girl might have a flowering shrub planted for her, the variety to be of her own selection, and it should then become her special care.

Several things might be done to make the schoolhouse yard interesting to the students. Upon the advent of each new pupil a tree, native to the latitude, might be planted. This would give a cerain dignity to each new pupil.

Much sentiment has attached to trees in all lands and in all ages. Acorns from the oaks of Mount Vernon were presented to the Tsar of Russia by a brother of the late Senator Sumner. They were planted, by order of the emperor, in the imperial

preserves of St. Petersburg, and there grew into fine trees, the acorns from which were, in their turn, brought back to the United States by Mr. Hitchcock, then ambassador to Russia and now Secretary of the Interior. These acorns will be planted at Mount Vernon, near their "grandparents."

After a recent visit to England, Senator Hoar of Massachusetts brought back young British oaks from the royal forest of Dean and chestnuts from the estates of the Earl of Ducie. These will be studied by our foresters as they grow in the mall at Washington. Within the enclosure of the Botanical Gardens at Washington many trees, planted by prominent American statesmen, have grown to be objects of great interest and beauty.

Charles Sumner planted a European hornbean; Thaddeus Stevens an Oriental plane-tree; Senator Beck an American elm; President Hayes a rare variety of oak; Senator Hoar a cedar of Lebanon. A Scotch plane-tree planted by Senator Frye is pointed out to all visitors. There are many others, but enough have been mentioned to show the interest that attaches to a tree carrying the name of the person by whom it was planted.

Young people attending the country school would soon learn the names of all the trees indigenous to the neighborhood. If the pupils would gather the seeds of the trees at different seasons when they are ripe, the teacher would have an object-lesson to assist her in conducting nature studies. Methods of preserving these seeds through the winter and the habits of growth of the different varieties would be studied with intense interest and never forgotten. As the pupils visited new neighborhoods and new countries, their early forestry lessons would be valuable in enabling them to add to their knowledge of sylviculture.

The great life-work of Senator Morrill of Vermont, assisted by other far-seeing American statesmen, was the endowment of institutions in each State in the Union, where the sons and daughters of American farmers could study the sciences that relate to agriculture and domestic economy. A great ques-

tion, however, is the proper preparation of young country people for entering these agricultural colleges. The preparation must be given by the country school-teacher, and the query presents itself, "How shall the teacher be fitted for this work?"

In most of our States we have normal schools for teachers, yet some of our State agricultural colleges have not succeeded simply because the instructors had been educated in institutions that gave them too little of the sciences relating to agriculture. Progress is being made; the student of soils, plants and animals is finding his place in the class-room; but the giving of direction and bent toward the agricultural college must begin with the farmers' children in the country schoolhouse, and to this end we should have object-lessons on the schoolhouse grounds.

The dry ranges of the great West are being rapidly destroyed by injudicious grazing. The beautiful valleys of the mountain States are being rendered barren by the unwise application of water. The great wheatfields from the Missouri river to the Pacific ocean are losing their fertility, and the grains are losing their nitrogenous content by continual robbery of the soil. Summer fallowing and the sowing of one crop in two years are becoming universal.

The young farmer attending the district school could readily be taught what a plant gets from the soil and what it gets from the air. The several grasses could be planted, and their office in filling the soil with humus, enabling the soil to retain moisture, could be explained. The legumes—peas, beans, clover and alfalfa—could be grown in the schoolhouse yard, and during recess or at the noon hour the teacher could interest the students by digging up a young pea of clover root and showing the nodules, whose office it is to bring the free nitrogen from the atmosphere and fix it in the soil.

The pupils would see that some relation exists between the size of the nodule and the fruit of the legume. As a plant grows older and blossoms and seeds begin to form, the matter found in the nodules rises in the plant to help make seeds,

HIGH SCHOOL BUILDING.
Bruce, Everett & Hays, Architects.